In re Patent Application of:
MEARS
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IN THE CLAIMS:

Please cancel Claims 1 to 71.

Please add new Claims 72 to 107.

72. (new) A semiconductor device comprising:

a superlattice comprising a plurality of stacked groups of layers; and

each group of layers of said superlattice comprising a plurality of stacked base germanium monolayers defining a base germanium portion and an energy band-modifying layer thereon;

said energy-band modifying layer comprising at least one non-semiconductor monolayer constrained within a crystal lattice of adjacent base germanium portions.

73. (new) A semiconductor device according to Claim 72 wherein said superlattice has a common energy band structure therein.

74. (new) A semiconductor device according to Claim 72 wherein said superlattice has a higher charge carrier mobility in at least one direction than would otherwise be present.

75. (new) A semiconductor device according to Claim 74 wherein the higher charge carrier mobility results from a lower conductivity effective mass for the charge carriers in

the parallel direction than would otherwise be present.

76. (new) A semiconductor device according to Claim 75 wherein the lower conductivity effective mass is less than two-thirds the conductivity effective mass that would otherwise occur.

77. (new) A semiconductor device according to Claim 74 wherein the charge carriers having the higher mobility comprise at least one of electrons and holes.

78. (new) A semiconductor device according to Claim 72 wherein each energy band-modifying layer comprises oxygen.

79. (new) A semiconductor device according to Claim 72 wherein each energy band-modifying layer is a single monolayer thick.

80. (new) A semiconductor device according to Claim 72 wherein each base germanium portion is less than eight monolayers thick.

81. (new) A semiconductor device according to Claim 72 wherein each base germanium portion is two to six monolayers thick.

82. (new) A semiconductor device according to Claim 72 wherein said superlattice further has a substantially direct energy bandgap.

83. (new) A semiconductor device according to Claim 72 wherein said superlattice further comprises a base germanium cap layer on an uppermost group of layers.

84. (new) A semiconductor device according to Claim 72 wherein all of said base germanium portions are a same number of monolayers thick.

85. (new) A semiconductor device according to Claim 72 wherein at least some of said base germanium portions are a different number of monolayers thick.

86. (new) A semiconductor device according to Claim 72 wherein all of said base germanium portions are a different number of monolayers thick.

87. (new) A semiconductor device according to Claim 72 wherein each non-semiconductor monolayer is thermally stable through deposition of a next layer.

88. (new) A semiconductor device according to Claim 72 wherein each energy band-modifying layer comprises a non-semiconductor selected from the group consisting of oxygen, nitrogen, fluorine, and carbon-oxygen.

89. (new) A semiconductor device according to Claim 72 further comprising a substrate adjacent said superlattice.

90. (new) A semiconductor device according to Claim 72 wherein said superlattice further comprises at least one type of conductivity dopant therein.

91. (new) A semiconductor device according to Claim 72 wherein said superlattice defines a channel of a transistor.

92. (new) A semiconductor device comprising:

a superlattice comprising a plurality of stacked groups of layers; and

each group of layers of said superlattice comprising a plurality of stacked base germanium monolayers being less than eight monolayers to define a base germanium portion, and an energy band-modifying layer thereon;

said energy-band modifying layer comprising at least one oxygen monolayer constrained within a crystal lattice of adjacent base germanium portions.

93. (new) A semiconductor device according to Claim 92 wherein said superlattice has a common energy band structure therein.

94. (new) A semiconductor device according to Claim 92 wherein said superlattice has a higher charge carrier mobility in at least one direction than would otherwise be present.

95. (new) A semiconductor device according to Claim

94 wherein the higher charge carrier mobility results from a lower conductivity effective mass for the charge carriers in the parallel direction than would otherwise be present.

96. (new) A semiconductor device according to Claim 94 wherein the charge carriers having the higher mobility comprise at least one of electrons and holes.

97. (new) A semiconductor device according to Claim 92 wherein each energy band-modifying layer is a single monolayer thick.

98. (new) A semiconductor device according to Claim 92 wherein each base germanium portion is less than eight monolayers thick.

99. (new) A semiconductor device according to Claim 92 wherein each base germanium portion is two to six monolayers thick.

100. (new) A semiconductor device according to Claim 92 wherein said superlattice further has a substantially direct energy bandgap.

101. (new) A semiconductor device according to Claim 92 wherein said superlattice further comprises a base germanium cap layer on an uppermost group of layers.

102. (new) A semiconductor device according to Claim

92 wherein all of said base germanium portions are a same number of monolayers thick.

103. (new) A semiconductor device according to Claim 92 wherein at least some of said base germanium portions are a different number of monolayers thick.

104. (new) A semiconductor device according to Claim 92 wherein all of said base germanium portions are a different number of monolayers thick.

105. (new) A semiconductor device according to Claim 92 further comprising a substrate adjacent said superlattice.

106. (new) A semiconductor device according to Claim 92 wherein said superlattice further comprises at least one type of conductivity dopant therein.

107. (new) A semiconductor device according to Claim 92 wherein said superlattice defines a channel of a transistor.